<p style="text-align:center;"><u>CLAIMS</u></p>

What is claimed is:

1.   A method of virtually addressing a plurality of storage devices through a switch, including the steps:

establishing a file session between a client and the switch, wherein the switch appears as a virtual storage device;

selecting in the switch one of a plurality of storage devices coupled with the switch to participate in the file session; and

programming logic in the switch to forward packets in the file session to the selected storage device.

2.   The method of claim 1, wherein the client having TCP logic to participate in a file session recognizes the switch as a virtual storage device without modification of the TCP logic.

3.   The method of claim 1, wherein the virtual storage device conforms to a SCSI over IP protocol.

4.   The method of claim 1, wherein the virtual storage device conforms to a NAS disk protocol.

5.   The method of claim 1, wherein the virtual storage device conforms to a NASD disk protocol.

6.   The method of claim 1, wherein selecting one of a plurality of storage devices includes inspecting data transmitted with a file session packet and selecting the storage device responsive to said data.

1   7.   The method of claim 1, wherein the switch includes a file directory and

2   selecting one of a plurality of storage devices includes inspecting data transmitted with a

3   file session packet and accessing the file directory to select the storage device responsive

4   to said data.

1   8.   The method of claim 1, wherein the switch includes a file directory and

2   selecting one of a plurality of storage devices includes inspecting data transmitted with a

3   file session packet and accessing the file directory to select the storage device hosting a

4   file responsive the said data.

1   9.   The method of claim 1, wherein the switch includes a file directory and

2   selecting one of a plurality of storage devices includes inspecting data transmitted with a

3   file session packet and accessing the file directory to select the storage device having

4   characteristics responsive to said data.

1   10.   The method of claim 1, further including the steps:

2   determining in the selected storage device to redirect the file session to an other

3   device;

4   handing off the file session to an other storage device; and

5   reprogramming the switch to forward packets in the file session to the other

6   storage device.

1   11.   The method of claim 1, wherein handing off the file session and

2   reprogramming the switch are transparent to the client.

1   12.   The method of claim 1, wherein at least one of the plurality of storage

2   devices coupled with the switch is an other switch configured to appear as a virtual

3   storage device.

1   13.   A method of addressing a plurality of storage devices connected to a

2   network as a single virtual storage device, including the steps:

3   inserting a switch between the storage devices and the network, wherein the

4   switch appears as a virtual storage device;

5   accepting in the switch a request to establish a file session between a client and the

6   switch; ·

7   selecting in the switch one of a plurality of storage devices attached to the switch

8   to participate in the file session; and

9   programming the switch to forward packets in the file session to the selected

10   storage device.

1   14.   The method of claim 13, wherein the client having logic to participate in a

2   file session recognizes the switch as a virtual storage device without modification of the

3   client logic.

1   · 15.   The method of claim 13, wherein the virtual storage device conforms to a

2   SCSI over IP protocol.

1   16.   The method of claim 13, wherein the virtual storage device conforms to a

2   NAS disk protocol.

1   17.   The method of claim 13, wherein the virtual storage device conforms to a

2   NASD disk protocol.

1   18.   The method of claim 13, wherein selecting one of a plurality of storage

2   devices includes inspecting data transmitted with a file session packet and selecting the

3   storage device responsive to said data.

1   19.   The method of claim 13, wherein the switch includes a file directory and

2   selecting one of a plurality of storage devices includes inspecting data transmitted with a

3   file session packet and accessing the file directory to select the storage device responsive

4   to said data.

1   20.   The method of claim 13, wherein the switch includes a file directory and

2   selecting one of a plurality of storage devices includes inspecting data transmitted with a

3   file session packet and accessing the file directory to select the storage device hosting a

4   file responsive the said data.

1   21.   The method of claim 13, wherein the switch includes a file directory and

2   selecting one of a plurality of storage devices includes inspecting data transmitted with a

3   file session packet and accessing the file directory to select the storage device having

4   characteristics responsive to said data.

1   22.   The method of claim 13, further including the steps:

2   determining in the selected storage device to redirect the file session to an other

3   device;

4   handing off the file session to an other storage device; and

5   reprogramming the switch to forward packets in the file session to the other

6   storage device.

1   23.   The method of claim 13, wherein handing off the file session and

2   reprogramming the switch are transparent to the client.

1   24.   The method of claim 13, wherein at least one of the plurality of storage

2   devices attached to the switch is an other switch configured to appear as a virtual storage

3   device.

1   25.   A switch supporting virtual addressing a plurality of storage devices,

2   including:

3   a storage medium; and

4   a processor connected to the storage medium,

5   the storage medium storing

6   a program for controlling the processor; and

7   the processor operative with the program to

8   establish a file session between a client and the switch, wherein the

9   switch appears as a virtual storage device;

10   select one of a plurality of storage devices attached to the switch to

11   participate in the file session and store an address corresponding to

12   the selected storage device; and

13   forward packets in the file session to the selected storage device

14   based on the stored address.

1   26.   The device of claim 25, wherein the client includes logic to participate in a

2   file session and the program is operative to appear to the client logic as a virtual storage

3   device without modification of the client logic.

1   27.   The device of claim 25, wherein the virtual storage device conforms to a

2   SCSI over IP protocol.

1   28.   The device of claim 25, wherein the virtual storage device conforms to a

2   NAS disk protocol.

1   29.   The device of claim 25, wherein the virtual storage device conforms to a

2   NASD disk protocol.

1   30.   The device of claim 25, wherein selecting one of a plurality of storage

2   devices includes inspecting data transmitted with a file session packet and selecting the

3   storage device responsive to said data.

1   31.   The device of claim 25, wherein the storage medium stores a file directory

2   and the program is operative to inspect data transmitted with a file session packet, access

3   the file directory and select the storage device responsive to said data.

1   32.   The device of claim 25, wherein the storage medium stores a file directory

2   and the program is operative to inspect data transmitted with a file session packet, access

3   the file directory and select the storage device hosting a file responsive the said data.

1   33.   The device of claim 25, wherein the storage medium stores a file directory

2   and the program is operative to inspect data transmitted with a file session packet, access

3   the file directory and select the storage device having characteristics responsive to said

4   data.

1   34.   A method of fail-over from a first storage device involved in a file session

2   to a second storage device, including the steps:

3   predicting in a switch coupled to a first storage device that the failure of the first

4   storage device will require a fail over;

5   selecting a second storage device to which to redirect the file session;

6   handing off the file session to the second storage device; and

7   reprogramming the switch to forward packets in the file session to the second

8   storage device.

1   35.   The method of claim 34, wherein handing off the file session and

2   reprogramming the switch are transparent to a client involved in the file session.

1   36.   The method of claim 34, wherein the switch comprises one or more input

2   processors, logic to process packets, switch fabric, a forwarding table and one or more

3   output processors.

1   37.   The method of claim 36, wherein handing off the file session and

2   reprogramming the switch are transparent to a client involved in the file session.

1   38.   The method of claim 36, wherein the switch appears to a client as a virtual

2   storage device conforming to a SCSI over IP protocol.

1   39.   The method of claim 36, wherein the switch appears to a client as a virtual

2   storage device conforming to a NAS disk protocol.

1   40.   The method of claim 36, wherein the switch appears to a client as a virtual

2   storage device conforming to a NASD disk protocol.

1   41.   A method of fail-over from a first storage device involved in a file session

2   to a second storage device, including the steps:

3   determining in a switch coupled to a first storage device that the failure of the first

4   storage device requires a fail over;

5   selecting a second storage device to which to redirect the file session;

6   handing off the file session to the second storage device; and

7   reprogramming the switch to forward packets in the file session to the second

8 storage device.

1   42.   The method of claim 41, wherein handing off the file session and

2 reprogramming the switch are transparent to a client involved in the file session.

1   43.   The method of claim 41, wherein the switch comprises one or more input

2 processors, logic to process packets, switch fabric, a forwarding table and one or more

3 output processors.

1   44.   The method of claim 43, wherein handing off the file session and

2 reprogramming the switch are transparent to a client involved in the file session.

1   45.   The method of claim 43, wherein the switch appears to a client as a virtual

2 storage device conforming to a SCSI over IP protocol.

1   46.   The method of claim 43, wherein the switch appears to a client as a virtual

2 storage device conforming to a NAS disk protocol.

1   47.   The method of claim 43, wherein the switch appears to a client as a virtual

2 storage device conforming to a NASD disk protocol.

1   48.   A method of load balancing between a first device and an other device

2 coupled to a switch, including the steps:

3   determining in a first device coupled to a switch that the work load of the first

4 device warrants a session transfer;

5   selecting an other device to which to transfer the session;

6   handing off the session to the other device; and

7   reprogramming the switch to forward packets in the session to the other device.

1   49.   The method of claim 48, wherein handing off the session and

2   reprogramming the switch are transparent to a client coupled to the switch.

1   50.   The method of claim 48, wherein the switch comprises one or more input

2   processors, logic to process packets, switch fabric, a forwarding table and one or more

3   output processors.

1   51.   The method of claim 50, wherein handing off the file session and

2   reprogramming the switch are transparent to a client coupled to the switch.

1   52.   A method of load balancing between a first device and an other device

2   coupled to a switch, including the steps:

3   determining in a switch coupled to a first device that the work load of the first

4   device warrants a session transfer;

5   selecting an other device to which to transfer the session;

6   handing off the session to the other device; and

7   reprogramming the switch to forward packets in the session to the other device.

1   53.   The method of claim 52, wherein handing off the session and

2   reprogramming the switch are transparent to a client.

1   54.   The method of claim 52, wherein the switch comprises one or more input

2   processors, logic to process packets, switch fabric, a forwarding table and one or more

3   output processors.

1   55.   The method of claim 54, wherein handing off the session and

2   reprogramming the switch are transparent to the client.

1   56.   A method of load balancing between a first switch involved in a file

2   session to a second switch, the first and second switches being connected to a plurality of

3   storage devices, including the steps:

4   determining in a first switch coupled to a second switch that a file session

5   involving the first switch should be handled by the second switch;

6   handing off the file session to the second switch; and

7   reprogramming the first switch to forward packets in the file session to the second

8   switch.

1   57.   The method of claim 56, wherein handing off the file session and

2   reprogramming the first switch are transparent to a client involved in the file session.

1   58.   The method of claim 56, wherein the first and second switches comprise

2   one or more input processors, logic to process packets, switch fabric, a forwarding table

3   and one or more output processors.

1   59.   The method of claim 58, wherein handing off the file session and

2   reprogramming the first switch are transparent to a client involved in the file session.

1   60.   The method of claim 58, wherein the first switch appears to a client as a

2   virtual storage device conforming to a SCSI over IP protocol.

1   61.   The method of claim 58, wherein the first switch appears to a client as a

2   virtual storage device conforming to a NAS disk protocol.

1   62.   The method of claim 58, wherein the first switch appears to a client as a

2   virtual storage device conforming to a NASD disk protocol.